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MAN AND HIS NERVOUS SYSTEM IN THE WAR

BEING SOME REFLECTIONS UPON THE RELATION OF AN ORGANISM TO ITS ENVIRONMENT. IV

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THE ONSET OF THE GREAT WAR

The civilized world was startled in August, 1914, by the onslaught of the Teutonic hordes upon the people of Belgium and France. We had heard vague rumors of the gathering of the forces of war, and had heard the distant rattle of the saber at times. Some gifted individuals with a vision of the future had warned us, but we had not heard. We had seen the growth of autocratic power, but we forgot the principles of government worked out by our Anglo-Saxon ancestors, and we failed to appreciate the menace to the world of autocratic power at the head of a nation of millions of docile subjects. History was supposed to be one of the agents which would aid man in his process of muddling through by reminding him of past mistakes and the dangers of some unfortunate past experiences. But we heeded not the lessons of history, or did not know them. Some there were who cared not for history, and some said that the time spent on the study of history in our schools was wasted. In one sense, unfortunately, these latter may have been right, for few saw the approach of the storm before it broke. We were dazzled by the glamor of high organization and efficiency and we counted not the cost which must be paid for them. Like a storm, which, eluding the meteorological service, sweeps in from the sea, the war broke upon most of us without warning. But if we look backward, there are few elements in the present conflict that had not been the cause of uneasiness to statesmen and philosophers in the centuries that went before. Mention has already been made of the change in science, with the shifting from the basis of science for its own sake to the basis of work for practical ends. Some of us before the war noted the decadence in freshness and originality in the scientific thought of Germany, and were inclined to place its beginnings in the last decade of the nineteenth century. The extravagance of the imperialistic spirit, and the growing intimacy of the ruler and the leading diety were made plain to the world in general. All these things had been noticed in Egypt and Babylon, and in both empires, they presaged disaster. The reaction of free peoples to the attempt to force such conditions upon the civilized world was similar to the reactions exhibited by other free peoples in other centuries when similar attempts were made to force such conditions on them. Man's internal organization shapes his behavior, and changes in internal organization come about only as the result of processes of evolution, most of which require great periods of time for their completion. Only in those countries whose peoples were decadent, or whose internal organization was such that individuality was not a matter of great importance, has the proper reaction failed to appear. But, although the combination of Teutonic ruler and leading deity loudly proclaimed the decadence of the peoples of the earth, such decadence either did not exist, or was confined to Germany. Judging from the lack of originality in Germany, individuality, aside from that manifested by the ruling combination, is not a matter of great consequence, and one would really look for a certain form of decadence there. The usual reaction occurred, and the Teutonic hordes were driven back.

But if we outside of Germany had not learned the lessons of the past, we were no worse than the denizens of Unter den Linden or Wilhelmstrasse, for assuredly they had not learned either. The Bourbon kings are not the only ones who "learned nothing and forgot nothing." The Hohenzollerns had not learned that virile races resent attempts on the part of the ruler and leading deity of an enemy country to suppress the expression of their individuality. They had not forgotten the traditions of the Egyptian and Babylonian kings. Their failure, either to learn or to forget, has brought disaster to them as well as to us, and we most unselfishly hope that theirs will be the greater disaster.

THE CHANGE IN GERMAN IDEALS

Strangely enough, one of the most beautiful expressions of the biological ideal of life as I see it comes from the nation in which, in the immediate past, the world has witnessed a recrudescence of monarchical absolutism as rigid as that of Assyria or Babylonia. As Goethe stated it:

Wie das Gestirne,
Ohne Hast, ohne Rast,
Drehe sich jeder
Um die Eigene Last.

But in Germany of the last decade there were few indeed who could draw each one toward his own goal. The recent ruling house of Prussia whose ancestors five hundred years age were in "Hide and Hair" (perhaps because of his myopia Treitschke was unable to see the cloven hoof, or because of his deafness was unable to hear the clatter) had not only arrogated to itself the privilege of regulating the destinies of all individuals in the German Empire, but had also expressed the desire to extend the same beneficent protection to the individuals of the world in general. But the world in general has long assumed this to be the prerogative of a Being of much greater historical antiquity and, as we have been wont to believe, vastly greater ability than any member of the Prussian ruling house who has yet appeared. To meet this objection, the Kaiser has announced that the welfare of the world has been expressly delegated to his care while his immediate superior is looking after the rest of the universe. To some of us, the credentials which the Kaiser presented are in the same class with other German state documents—mere scraps of paper. There is one point on which the Kaiser may claim a biblical resemblance,—"I came not to send peace upon earth but a sword." One point of resemblance is not, however, sufficient to establish the identity of the species of two individuals, and few other points of resemblance occur to me at this moment. But granting all that even the most charitably inclined person could grant, that the Kaiser is not a sufficiently competent systematist to be sure of his identification, and that this delegation of power really comes from the German tribal deity, I still confess to lingering doubt whether the Kaiser is strictly correct in his idea of the geographical location of the dwelling place of this tribal deity. To my mind the geographical range assigned is incorrect, for it partakes much less of the nature of a creature of light than a being of darkness.

The mistake of the German war lords is as patent to the biologist as to the politician or the statesman. If I interpret the course of organic evolution correctly, it has made of man's brain, and through it his mind, a force of nature. There have been occasional lightning flashes of genius in the course of history, and some cataclysms in the form of revolutions, but, on the whole, its action has been more like that of other forces of nature which first cut deep valleys in a newly elevated tableland, then widen the valleys, disintegrate the rocks and reduce them to fine particles, and transport them to other regions until only the hills remain. Finally the hills are leveled and the genial plain is open to view. So, century after century, man has been making assaults upon the strongholds of absolutism until, in all the civilized world, there is now, let us hope, not one flagrant remnant. The holders of the castle would come forth to dominate the earth, but their vision of a subjugated earth is not to be realized. Not even their shining swords could cope with a force of nature, but fools that they were, they knew not what they would do.

THE PROBLEMS OF THE POST-BELLUM PERIOD

The problems arising out of the war are not settled by the mere cessation of hostilities. The problems of reconstruction demand solution, and upon the wisdom of their solution hangs the destiny of millions of people for years to come. Some comments on these may be permissible here.

I have written of the struggle of man against conventions which repressed the expression of his individuality. Perhaps some may infer that I would do away with all restraint, but against such an inference I would utter a protest. There are good biological reasons why all restraint should not be removed, and one might argue that certain other forms of restraint should be added. In fact, I believe that some additional restraint may be placed upon some tendencies in human nature.

The effort of the Kaiser and the war lords of Germany to impose their will upon others may be regarded as a form of behavior shaped by their internal organization, and, hence, as an effort to express their particular type of individuality. That such efforts should be restrained, few outside of the Teutonic empires or not of Teutonic ancestry will doubt. The war was the immediate effort to restrain such tendencies, but wars do not last forever, and the duration as well as the security of peace will depend upon what means of restraint is adopted after the war. A change in internal organization might be one solution of the difficulty, but I am not sanguine that this can be effected. The student of animal nutrition, regarding the animal as a chemical mechanism, recognizes that, from the dietary point of view, "the internal organization of an animal is not accessible to improvement."[10] Having settled this point, he must do the best he can with whatever foodstuffs may be available. Although, as I have emphasized in these pages, the organization of the higher portions of man's nervous system is not as rigid as that of the chemical mechanisms of the body, I still think it the part of wisdom not to assume that any great changes in reaction will occur, but to assume that, because of an internal organization which one can not greatly change, the reactions will not tend to change greatly.[11]

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[10] Armsby, "The Conservation of Food Energy," Philadelphia, 1918, p. 26.

Having made such an assumption, we should select such remedies as will best suit the conditions. Anglo-Saxon races in general have tried to permit the manifestation of individuality on the part of the citizens of the state by limiting on the one hand, the power of the state to interfere, and on the other hand, providing lawful means of restraint for such persons as failed to recognize or to heed the restraints imposed by reason. There is no known way of preventing a ruler from becoming mad, but ways may be devised for preventing him from exerting unlimited and unchecked power during his madness. When a whole race becomes mad, forcible restraint becomes necessary, but, if left to itself, there is little chance that a whole race will ever become mad. But if the race is to be trusted, the power of a mad ruler to sway them must be curbed. One mad individual can do but infinitesimal harm alone compared to the harm he may do when he retains unchecked control of a whole people in his madness. But happily the effort of the War Lord of Potsdam to impose his own kind of convention upon the peoples of the world has turned out to be simply another illustration of the vanity of human ambition.

Despite the comments of philosophers on the vanity of human ambition, there is little fear, or hope, that it will fail among the children of men. And the prudent children of men will seek ways whereby the ambitious one may be prevented from injuring his fellows. The establishment of democratic forms of government has done much to remove the menace of political and military ambition, but other forms of civil ambition have grown up since the days of the Magna Charta, the control of which has not yet been satisfactorily worked out. It would seem to a mere civilian that the same principles which led our Anglo-Saxon ancestors to limit the power of one man or small group of men in a political way might be extended to all other forms of human activity.

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[11] If the conviction expressed in the text be well founded, then, broadly speaking, *as his neurones are, so the man is.* In this sense Goethe's words, in the mouth of Mephistopheles, can be made to bear a new and almost prophetic significance:

Du bist am Ende—was Du bist.
  Setz Dir Perrücken auf Millionen Locken,
  Setz Deinen Fuss auf ellenhohe Socken,
Du bleibst doch immer, was Du bist.

Barker, L. F., "The Nervous System and Its Constituent Neurones," p. 221, New York, 1899.

As a biologist, I would emphasize the vast possibilities for evil of a trained or highly organized group of men in the higher stages of society. Without organization and propaganda, ideas make their way but slowly, and only after long discussion. The glamor of organization and efficiency have appealed to us strongly, and we have allowed the formation of great and powerful organizations which are in control of machinery for extensive and widespread propaganda. Many of them have the avowed intention of forcing their own particular types of convention upon great numbers of people. Many of them have expressed the best intentions and have done no great harm as yet. Others have already shown evidences of sinister designs. Many were patterned after similar organizations with strong centralized power. It will be well for us if we recognize these possibilities early rather than late.

The German idea has permeated our universities more than some of us would wish. German universities became a part of the machinery for imperialistic propaganda, and a grateful government has, in turn, established machinery for propaganda for the use of the universities. We have been so harangued and shrieked at by German men of science that, without machinery for propaganda, ideas originating in other countries or ideas opposed to those made in Germany had small chance of meeting with the calm, dispassionate consideration which scientific questions demand, and without which opinion in science becomes but little more than a mere manifestation of mob psychology. Prussian ways of getting professorships, Prussian methods of control once the professorship is obtained, and the will to power rather than disinterested scholarship and service, while by no means universal or universally commended, have been too frequent in American universities to conduce to perfect equanimity on the part of those who believe in democratic principles of merit and justice. It was with these things in mind that a friend expressed in 1914 the hope that one result of the war would be that our universities would become less Prussianized.

Teutonic influence has extended still farther into academic affairs in America. Impressed by the 42-centimeter Busy Berthas and the potency of poisonous gases in warfare, which have been the fruits of the application of German science to the practical affairs of life, there has been much agitation in university and some other educational circles for the extension of practical education and the restriction or suppression of other forms of academic activity. Practical knowledge is necessary for some of the practical affairs of life, and no one would deny its value. But the argument that we must do certain things because they have been done in Germany leads one to inquire whether the results will be the same here as in Germany. Until some assurance is forthcoming on this point, I am not willing to sacrifice any or all independent opinion of my own merely for the sake of imitating Germany. And I would like further assurance that study of a non-practical sort is without value to the world in general. One might go even farther than this and ask for assurance that work of a non-practical nature is actually harmful to the world. For the scholar works out those things which express his own individuality, and the attempt to restrict such a means of expression is similar in its nature to other attempts to impose restraint upon individuality by setting up an arbitrary convention.

We have forgotten, however, some other things in Germany when we focus our attention upon merely practical matters of their educational system. Art has flourished in Germany in times past and their galleries have been enriched by fair means or foul by great works from other countries. Long ago Huxley called attention to some of the defects of a purely "practical education" and it may be well to recall his words now, for I believe that they are worthy of serious consideration to-day.

> The mental power which will be of most importance in your daily life will be the power of seeing things as they are without regard to authority; and of drawing accurate general conclusions from particular facts. But at school and at college you shall know of no source of truth but authority; not exercise your reasoning faculty upon anything but deduction from that which is laid down by authority.
>
> You will have to weary your soul with work, and many a time eat your bread in sorrow and in bitterness, and you shall not have learned to take refuge in the great source of pleasure without alloy, the serene resting place for worn human nature—the world of art.

Practical matters or science or applied science have engaged men's attention in the days of the war, and there are some, even many, who fear that the scholar who works not toward practical ends alone will disappear in the process of reconstruction after the war. But idealism has survived in the world too long to disappear now. For if, by any mischance, the scholar should be driven from our universities and be supplanted by merely practical men, somewhere in the world he will find refuge. We may, in the last extremity, go part way back to the conditions of the scholar in Paris in the fifteenth century as Victor Hugo describes them:

> The Ville contained the Halles, the City the Hotel Dieu, and the University the Pre aux Clercs. For offences committed by the students on the left bank (of the Seine), in their pre aux Clercs, they were tried at the Palace of Justice in the Island, and punished on the right bank at Montfaucon, unless the rector, finding the University strong and the king weak, chose to interfere; for it was the privilege of the scholars to be hanged in their own quarters.[12]

There is small hope that all his former privileges will be restored in their entirety unless liberal legislatures amend the charters of our universities so as to allow the erection of their own gallows, but somewhere or somehow the scholar will claim and receive some of his ancient privileges even among the practical men of the day. Perhaps those universities which have established schools of electrical engineering might substitute the electric chair for the ancient gibbet. Garrets may again come into style, and hermitages in the forest may again shelter him from the elements, but the scholar will and must work. But the value of idealism for the world is not yet passed. Surely it is safer for the world that the pale student should spend his time in deciphering the tattered fragments of a Greek palimpsest than that he spend his time in devising a new poison wherewith to slay his fellow man. It is safer for the world that an astronomer should spend his time calculating the motions of a distant sun than that he should calculate the path of a projectile that will kill women in a church seventy miles away. It is better that a man lose his life in vain searching for the pole than that he save it in dreaming of "Weltmacht oder Niedergang," unless he achieves Niedergang. It is better for the world that our children should see great works of art, or great collections in museums than that they grow up on a diet of blood and iron. It is better that one should penetrate to the nethermost parts of the earth and brave the danger of beasts of prey or disease-bearing insects than that he should dream of feats of arms in a war of conquest. For high enterprise and romance are not dead in the world and the history of science itself is "the history of an adventure." But the scholar sets not out on his adventure deliberately to slay.

While the idealist may dream of the day when restraint shall no longer be necessary among the children of men, those who pay attention to the facts of biology must recognize that restraint is still necessary. It is not within the province of the biologist to impose this restraint. That task falls to the lawmaker, with whom the biologist has seldom maintained intimate personal relations. Yet the problem of the lawmaker and the problem of the biologist have some elements in common.

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[12] "Notre Dame," Book III., Chap. II.

The methods of science and of law have certain elements in common, although attention is usually focused on their differences rather than on their resemblance. The practise of law consists in the application by deductive reasoning of the principles of law to particular cases. The actual practise of science lies more in the accumulation of facts from which we may one day arrive at a general principle through a process of induction. Yet law must have its inductive side, for the great jurists of the world have built up its principles, which lesser men may apply. And when the great scientist has built up his induction from the facts accumulated by many lesser men, application to particular cases by deductive reasoning is a legitimate method of science (Thomas Case). The man of science has sometimes commented on the waste of human energy resulting from the obscurity of some of the forms of law and the technicalities of its administration.[13] But just as the man of science recognizes the difficulty of arriving at a clear, definite and unequivocal statement of an induction from the facts at his disposal, so the clear-minded man of law recognizes the difficulty of making a clear, definite and unequivocal statement of a legal principle. But the man of science recognizes that the inductions of science must be revised from time to time, or even wholly rejected, as the number of facts increases and their relationships are more carefully studied. The man of law sometimes insists on the retention of his venerable forms and attempts to fit all modern conditions to an old generalization. The body of law is apt to become a rigid convention and, although the motives of its founders were without reproach, to become an impediment to progress. I have called attention elsewhere to the fact that previous attempts to settle international disputes in accordance with the terms of existing convention have not been wholly successful in avoiding subsequent disagreements or in preventing later wars.[14]

The peace conference which is to meet to settle the late war will be faced with the task of arriving at certain principles for the guidance of nations. Those principles, whatever they may be, must be arrived at by a process of inductive reasoning. For the peace and security of future generations, let us hope that the final decision of this conference will be in accordance with the facts as they are known to-day, and that the attempts to impose restraint upon generations to come by the retention of outworn and biologically vicious convention will fail. For unless coming generations are decadent, they will refuse to be bound by arbitrary convention and the struggle will break out anew.

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[13] Bagehot, "Physics and Politics."

[14] Pike, *The New York Times*, 1917.

The view that individuality is a product of a result of evolution which I have arrived at is not particularly new. But it needs to be kept before us. Bergson's statement has already been quoted. It seems worth while to give here a statement by an American psychologist and philosopher with a more distinct political bearing:

> The practical consequence of such a philosophy (*i. e.*, the philosophy of looking for the significant things in the lives of others), is the well-known democratic respect for the sacredness of individuality, is, at any rate, the outward tolerance of whatever is not itself intolerant.
>
> These phrases are so familiar that they sound now rather dead in our ears. Once they had a passionate inner meaning. Such a passionate inner meaning they may easily acquire again if the pretensions of our nation to inflict its own inner ideals and institutions *vi et armis* upon Orientals should meet with a resistance as obdurate as so far it has been gallant and spirited. Religiously and philosophically, our ancient doctrine of live and let live may prove to have a far deeper meaning than our people seem to imagine it to possess.[15]

In the interest of stability of our American institutions, it is to be hoped that the attempt of a European nation to inflict its own inner ideals and institutions *vi et armis* upon other nations and ourselves may act quite as effectively as James hoped the resistance of the Orientals to our own attempts would in imparting a passionate inner meaning to the phrases that sounded so dead five years ago. Let us hope also that the deeper meaning of our ancient doctrine of live and let live may come to us without further unhappy experience. For, as I believe, certain forms of propaganda in our country are not far removed in spirit from militarism, and neither is far from intolerance.

As for our failure to appreciate the teaching of history, another sentence of James is pertinent here: "The changing conditions of history touch only the surface of the show."[16]

History to most of us is a matter of the distance receptors alone, and may have no significance for us. It is only when things touch us more closely, when they become matters of the contact receptors, the proprioceptors and the interoceptors that they have real significance to us and awaken a real human interest. The Egyptians and Babylonians were too far away for anything but the distance receptors to reach them, and we did not translate our impressions from sight and hearing into the terms of impressions from other sense organs. The present war should have touched us deeply enough, and should have made sufficient appeal to those receptors which apprise us of pain and sweat and hunger to give history a real meaning among us for generations to come.

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[15] James, William, from the preface to "Talks to Teachers and Students," New York, 1900.

[16] *Ibid.*, p. 300.

History, from one point of view, has a distinct interest to the biologist. The intrigues of rulers and the salacious details of the private life of court personages does not necessarily impress him. But the reaction of a people to any given set of social or political conditions may have a more intimate relation to the work of the naturalist. For just as the testimony of the rocks, the paleontological history of animals, shows what course the evolution of form has followed in the race, so we may regard the record of history as showing what man has done under a given set of conditions which, in more ways than one, bear a resemblance to some of the experimental conditions which we sometimes impose in order to study the behavior or reactions of animals.

A quarter of a century before James wrote, the memory of the events of our Civil War was still vivid enough to lend significance to the facts of history. To quote again from Lowell:

> They steered by stars the elder shipmen knew,
> And laid their courses where the currents draw
> Of ancient wisdom channeled deep in law,
> The undaunted few
> Who changed the Old World for the New,
> And more devoutly prized
> Than all perfection theorized
> The more imperfect that had roots and grew.

If in so short a span as one generation we shall again forget the stars the elder shipmen knew, and in the space of half a century be again involved in a struggle for our existence as free men, let us hope that we will not fail. Wars will probably not cease because attempts at aggression will end, but if wars do cease, it will more likely be because we learn to recognize early the signs of danger, and deal with the agents of evil before they become too powerful to be controlled. Before we become able to do this as a nation, we must recognize the value of "The more imperfect thing that had roots and grew" as compared with the schemes for universal salvation that are being so generously set before us in these later days. We may vaguely wonder whether the doctrine of "America über Alles," unashamed and unrebuked, will be wholly an influence for good.

I have attempted to show that the Prussian government of to-day has in it much of the elements of the old tribal theocracies. I have attempted to show also that man's mind which, if I am right, is a product of his evolution, rebels against any such scheme of government. To the biologist such a system is merely the recrudescence or the persistence of superstition. I have attempted to point out also some of the dangers of such a scheme. But these dangers have been so well summed up and so trenchantly expressed by a philosopher that I quote them in closing. Few in his day appreciated their significance, and many and bitter were the attacks upon the author at the time, but the application to the Prussia of the past two decades seems clear. To those who would save such a system as the Prussian autocracy the words may be particularly dedicated: "That which you keep in your hearts, my brothers, is the slender remnant of a system which has made its red mark on history, and still lives to threaten mankind. The grotesque forms of its intellectual belief have survived the discredit of its moral teaching. Of this what the kings could bear with, the nations have cut down; and what the nations left, the right heart of man by man revolts against day by day. You have stretched out your hands to save the dregs of the sifted sediment of a residuum. Take heed lest you have given soil and shelter to the seed of that awful plague which has destroyed two civilizations and but barely failed to slay such promise of good as is now struggling to live among men."[17]

[17] W. Kingdon Clifford, "The Unseen Universe," London, 1879.